FACE INVESTIGATION

SUBJECT: Farm Worker Dies After Tractor Overturns

SUMMARY: An 18-year-old male farm worker (the victim) died after the tractor he was driving overturned and he received crushing injuries from being tossed in the cab. He had been using the tractor attached to a hay rake while raking hay in a field, and was making the last turn in a 12-acre field. The tractor overturned while he was turning around on a hillside with approximately 20E grade. The tractor was equipped with a rollover protection structure (ROPS) and seatbelt, but apparently the victim was not using the seatbelt at the time of the incident. The farm owner discovered the injured victim in the cab of the overturned tractor when he went to the field to deliver sandwiches for an afternoon break. The farm owner went to a nearby house to call for emergency services, which arrived within five minutes. The victim was pronounced dead at the scene by the medical examiner. To prevent future fatalities of this type, the FACE investigator recommends farm tractor owners and operators should:

- **always use an operator restraint system while operating a tractor equipped with rollover protective structures**

- **evaluate the terrain prior to beginning an operation with a tractor, and plan safe strategies for addressing the hazards**

In addition, farmers and other employers with workers assigned to work in isolated situations should:

- **provide personal communication devices to workers assigned to remote worksites.**

INTRODUCTION:

On June 22, 1999, an 18-year-old male farm worker died after being tossed in the cab of a tractor that overturned. The Wisconsin FACE field investigator was notified by the area OSHA office on June 23, 1999. On August 18, 1999, the field investigator visited the site and met with the farm owners. The FACE investigator also obtained the death certificate and the coroner and sheriff's reports. Telephone interviews were held with the victim's parents.

The employer was a dairy farm owned and operated by a family comprised of a couple and their three adult sons. The family had about 350 dairy cattle at two farm sites 3 miles apart, and raised crops for cattle feed at these sites and other fields owned or rented in the vicinity. Portions of the farm had been in the family for four generations. Seasonally, the family hired one or two farm workers to help with field and barn chores. The workers used the farm's equipment, and were expected to follow the safety practices of the farm.

There was no written safety program to cover all activities conducted on the farm. Most safety information was gained by on-the-job training. Additional information was obtained at equipment dealers, farm magazines, and farm organization meetings. The family also used videos and literature from equipment manufacturers to instruct farm workers on safe work practices. Until the incident, there had never been a tractor rollover on the farm, or

any serious or fatal injury. The family owned eight tractors, and all were equipped with ROPS. It is unknown how many had seatbelts.

The victim was a high school student on summer break, with intentions to attend the university farm short course after graduation. Although he was not raised on a farm, he had shown interest in farm machines and activities since he was a young child. He belonged to 4-H, and raised sheep and other animals at his family's rural property for show and profit. Prior to being hired by the farm family, he had worked at a neighbor's veal farm baling hay, picking stones and doing other chores. Recognizing his interest in farm machinery, his father bought him an old tractor about three years ago and insisted the victim obtain tractor safety training at that time[1]. The victim had not reported any injuries or near-misses from farm machinery.

The victim was a friend of the farm family, and had been hired at the farm about two months before the incident. He had volunteered at the farm prior to being hired, and was familiar with the family's farm routines and practices. His job duties included helping with the morning milking chores and usually doing field work in the afternoon. Between chores, he often went to the farmhouse for meals and breaks. His workday began around 8 AM each day, and usually ended around 5 PM, depending on the workload. He received on-the-job training, including safe work practices such as wearing a seatbelt while driving a tractor and driving slowly on curves and hills.

[1]Note: Wisconsin requires a one-time certificate of safety training for individuals under age 16 who operate tractors (except on their family's farm).

INVESTIGATION:
The incident occurred at a 12-acre hayfield located about 3 miles from the primary farm site. The hayfield terrain had gently rolling hills, and the field was irregularly shaped due to residential home sites that had been carved out of the larger field area. Weather conditions on the day of the incident were clear, warm and dry. The 17-year-old tractor involved in the incident was purchased new by the family, and had been used regularly since that time. The original four-post ROPS with open cab and seatbelts were in place, and had not been altered. The tractor had air-filled rear tires, and wide-set front wheels. A hay rake was attached to the tractor's PTO and drawbar.

The hayfield was located about three miles from the main farmsite. Terrain in the area was low-grade hills with long runs. New homes bounded the field on most of three sides, with a wooded area on the fourth side. The hay was cut and lying in broad rows that ran up and down the slopes. The victim went to the field about 2:30 PM to rake the hay, and was apparently completing the last turn on the rows when the incident occurred. He was at the top of a hill with approximately 20E grade, and was making a turn. The incident was unwitnessed, but it appears he applied the brakes on one side of the tractor while allowing the other side to turn freely, which allows the tractor to pivot 180E. It is unknown what his speed was during the turn. The tractor was equipped with a seatbelt, but apparently the victim was not using the seatbelt at the time of the incident. The farm owner discovered the victim lying on his back in the cab of the overturned tractor when he went to the field to deliver sandwiches for an afternoon break. The victim was not moving or making any sounds when he was discovered. The farm owner went to a nearby house to call for emergency services, which arrived within five minutes. The

victim was pronounced dead at the scene by the medical examiner. The tractor was in second gear with the engine off, when it was discovered. Subsequent testing of the brakes and transmission found them to be in good working condition.

CAUSE OF DEATH: The death certificate listed the cause of death as crushing chest injuries from a farm tractor accident.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Farm tractor operators should always use an operator restraint system while operating a tractor equipped with rollover protective structures.

Discussion: The tractor in this incident was manufactured with ROPS and a seat belt, and this equipment was in working condition at the time of the incident. Apparently, the seatbelt was not fastened when the tractor overturned, and the victim was tossed from the operator's seat and struck the cab structures. He was discovered lying on his back with his ahead against the top of the tractor, which was turned on its right side. His death might have been prevented if his seatbelt had been fastened. Seat interlock devices allow the tractor to be started only when the operator is seated and the operator is restrained by a seatbelt, safety bar, or other restraining device. Seat interlock devices are available on many late-model tractors.

Recommendation #2: Farm tractor operators should evaluate the terrain prior to beginning an operation with a tractor, and plan safe strategies for addressing the hazards.

Discussion: Hilly terrain may cause tractors to tip over when turning or traversing at a steep angle. Farm tractor operators should evaluate the slope and contours of the fields they will be working, and adjust tractor speed and turning radius to eliminate the tipping hazard. It is unknown what speed the tractor in this incident was traveling at when it tipped. The victim was making a sharp turn before the crest of a hill. The incident might have been prevented if the hay tending rows were planned to avoid sharp turns on hillsides.

Recommendation #3: Employers should provide personal communication devices to workers assigned to remote worksites.

Discussion: A reliable system for promptly communicating messages to and from individuals working in remote worksites can provide a safer work environment. Supervisory staff could use radios to locate isolated workers for urgent messages, and the workers could quickly summon assistance if an emergency occurred at their worksite. In this incident, the farm owner would have been able to summon emergency medical services to the site immediately if a portable phone had been available.

Figure 1. The arrow indicates the victim's location.